Transepithelial Transport and Stability in Blood Serum of Angiotensin-I-Converting Enzyme Inhibitory Dipeptides

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The dipeptides Ala-Trp, Val-Phe, and Val-Tyr inhibit the angiotensin-I-converting enzyme. They are encrypted within the primary sequences of different food proteins, *e. g.* milk proteins. The angiotensin-I-converting enzyme inhibitory potency of these synthetic dipeptides was quantified using a spectrophotometric assay. The dipeptides showed no adverse effects on differentiated Caco-2 cells (model for human intestinal epithelium), as confirmed by transepithelial electrical resistance, microscopy and the activity of the brush-border enzyme dipeptidyl aminopeptidase IV. Furthermore, the transport of these bioactive dipeptides through intact Caco-2 monolayers and their stability to incubation in human blood serum has been demonstrated for the first time. Low molecular mass peptides represent the minimal structures required for angiotensin-I-converting enzyme inhibition which have a high potential bioavailability. Therefore, they may act as target peptides in enriched hydrolysates for the preparation of an angiotensin-I-converting enzyme inhibitory peptide and for the use in special formulations as functional foods/foods of specified health use.

Key words: Angiotensin Converting Enzyme (ACE), Bioactive Peptides, Transepithelial Peptide Transport